

REMARKS

Applicant appreciates the detailed examination evidenced by the Office Action mailed June 29, 2005 (hereinafter "Office Action"). Applicant has added new Claims 36-41.

Applicant respectfully requests reconsideration and withdrawal of the rejections of Claims 1-22 based on U.S. Patent No. 6,468,858 to Lou (hereinafter "Lou") for at least the reasons provided below.

Independent Claims 1 and 13 are patentable over Lou

Independent Claim 1 stands rejected as anticipated by Lou. The Office Action asserts that FIG. 9 of Lou discloses "a conductive contact plug (fig. 9 reference 9) extending through an opening in the dielectric layer to contact the substrate and including a widened pad (fig 9 reference 60) extending onto the dielectric layer adjacent the opening," "an ohmic pattern on the pad portion of the plug; (fig 9 reference 10b)," and "a barrier pattern on the ohmic pattern (fig 9 reference 11b)." Office Action, p. 3. Thus, the Office Action appears to assert that the landing pad structure 60 corresponds to the recited "widened pad portion" of the contact plug, the tungsten shape 10b corresponds to the recited "ohmic pattern" and the ruthenium seed shape 11b corresponds to the recited "barrier pattern."

However, referring to column 4, lines 20-24 of Lou, the landing pad structure 60 of FIG. 9 is "comprised of underlying tungsten shape 10b, and overlying ruthenium seed shape 11b." Thus, the alleged "ohmic pattern" (tungsten shape 10b) is not "on" the alleged "widened pad portion" (landing pad structure 60) as recited in Claim 1. Similarly, the alleged "barrier pattern" (ruthenium seed shape 11b) does not have the relationship to the alleged "widened pad portion" (landing pad structure 60) and the alleged "ohmic pattern" (tungsten shape 10b) recited in independent Claim 1. Consequently, Lou does not disclose or suggest all of the recitations of Claim 1 and, for at least these reasons, Claim 1 is patentable over Lou. At least similar reasons support the patentability of independent Claim 13.

The dependent claims are patentable

Applicant submits that dependent Claims 2-12, 14-22 and 36-41 are patentable at least by virtue of the patentability of the various ones of independent Claims 1 and 13 from which they depend. Applicant further submits that many of the dependent claims are separately patentable.

For example, Claim 2, which stands rejected as anticipated by Lou, recites "wherein sidewalls of the ohmic pattern, the barrier pattern and the pad portion of the contact plug are substantially coplanar." As noted above, Lou does not disclose or suggest the configuration of a contact plug, ohmic pattern and barrier pattern recited in Claim 1 and, consequently, Lou cannot not disclose or suggest the sidewall alignment recited in Claim 2. For at least this reason, Applicant submits that Claim 2 is separately patentable.

Claim 3 recites "an etch stopper layer conforming to at least sidewalls of the ohmic pattern, the barrier pattern and the pad portion of the contact plug, " and Claim 4 recites "wherein the etch stopper layer also overlies a top surface of the barrier pattern." The Office Action rejects these claims as obvious over a combination of Lou and "further remark," which includes a reference to U.S. Patent No. 5,451,543 to Woo et al (hereinafter "Woo"). The Office Action specifically asserts that "a person skilled in the art . . . would have been capable from using the teachings by Lou and his ordinary design skill and come up with the invention of claims 3-6 without any special instructions." Office Action, p. 6.

This reasoning is erroneous because, even if combined, the Lou and Woo references would not teach the specific arrangements of a widened portion of a contact plug, an ohmic pattern, a barrier pattern and an etch stopper layer as recited in the claims. In particular, Lou describes a capacitor structure, while Woo describes an interconnect structure with no clear applicability to the capacitor structure of Lou.

Moreover, the Office Action fails to provided the evidence required to support modifying references under 35 U.S.C. § 103. To establish a *prima facie* case of obviousness, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings, and there must be a reasonable expectation of success of the combination. See MPEP § 2143. As affirmed by the Court of Appeals for the Federal

Circuit, to support combining references in a §103 rejection, evidence of a suggestion, teaching, or motivation to combine must be *clear and particular*, and this requirement is not met by merely offering broad, conclusory statements about teachings of references. *In re Dembiczak*, 50 USPQ2d 1614, 1617 (Fed. Cir. 1999). The Court of Appeals for the Federal Circuit has also stated that, to support combining or modifying references, there must be particular evidence from the prior art as to the reason the skilled artisan, with no knowledge of the claimed invention, would have selected these components for combination in the manner claimed. *In re Kotzab*, 55, USPQ2d 1313, 1317 (Fed. Cir. 2000).

These requirements are not met by the rejections. Claims 3 and 4, for example, recite specific configurations of an etch stopper layer in relation to a widened portion of a contact plug, an ohmic pattern and a barrier pattern. The Office Action cites no evidence from the prior art as to how the structure in Lou could be modified using the teaching of Woo to yield such a structure, much less evidence as to where the prior art indicates that such a modification of Lou might be advantageous. For at least these reasons, Applicant submits that dependent Claims 3 and 4 are separately patentable. Similar reasons support the separate patentability of dependent Claims 14 and 15.

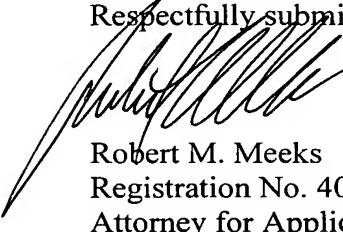
The obviousness rejections of Claims 11 and 22 based on a combination of Lou and U.S. Patent No. 6,704,220 to Lueschner (hereinafter "Lueschner") are erroneous for similar reasons. In particular, the Office Action cites Lueschner as teaching the recited etch stop layer, and supports this with a conclusory assertion that "a person skilled in the . . . would have been motivated to provide more protection for Lou using the teachings by Lueschner." Office Action, p. 8. Lueschner, however, relates to *magnetic* memory cells, and is thus far afield of the capacitive memory cells described in Lou. The Office Action fails to provide any evidence from the prior art as to how the metal etch stopper layer described in Lueschner would be incorporated into Lou, or why such a modification of Lou would be advantageous, e.g., why it might "provide more protection" in the capacitor structure in Lou. For at least these reasons, Applicant submits that Claims 11 and 22 are separately patentable.

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Conclusion

Applicant submits that the claims are patentable over the cited references for at least the reasons discussed above. Accordingly, Applicant requests allowance of the claims and passing of the application to issue in due course. Applicant encourages the Examiner to contact the undersigned by telephone to resolve any remaining issues.

Respectfully submitted,

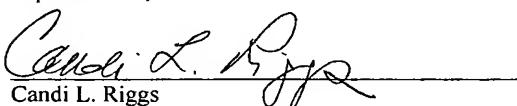


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